Appendices 1a-d and 2

Appendix 1a, Data sources and information provided

Source	Information provided
IMMIGRATION AND EMIGRATION DATA	
Norwegian Directorate of Immigration (UDI) (aggregated data)	**Immigration**: Total number of asylum seekers applying for residence in Norway by country of citizenship and by year of application (2008-2014). Age-distribution was reported as proportions by country of citizenship **Emigration**: Data on the number of immigrants who later emigrated. Time before emigration were based on the number of days from date of application to date of final rejection of application by country of citizenship and by year. Data were obtained as percentiles, i.e. the number of days reported as the 10th percentile reflected the number of days from date of application until date of final rejection for the ten percent with the shortest observation time, and so on.
Statistics Norway (SSB) (aggregated data)	**Immigration**: Total number of given residence permits for students, work immigrants, au-pairs and family reunifications in Norway by country of birth and year (2008-2014). Age-distribution was reported by country of birth and reason for immigration (proportions) **Emigration**: Information on average time in Norway before emigration by reason for immigration and year. Estimates are based on data from 2014.
CASE DATA	
Norwegian Surveillance System for Infectious diseases (MSIS) (case-based data)	Persons notified with TB or preventive treatment of latent TB in Norway, 2008 – 2016: individual-level data including category (TB or LTBI preventive treatment), age, country of birth, date of notification, date of diagnosis (collection of clinical sample), date of start of treatment and time in Norway prior to date of diagnosis (categorized as <1 month, 1-6 months, 7-12 months, 1-2 years, 3-4 years, 5-9 years, and >10 years)

Appendix 1b, Definitions

Definitions	Estimates
Immigration and emigration	We defined an immigrant as a person who applied for asylum or who received a residence permit (other immigrant groups). We defined emigration as having received a final rejection of application for asylum or being recorded as emigrated in SSB.
Country of origin	This reflects citizenship for asylum seekers and country of birth for other immigrant groups.
Number immigrants arriving in 2008-2011 and who eligible for screening	We estimated the proportion aged <15 years and 15-35 years by country, reason for immigration and year of immigration based on the reported age-distribution from SSB/UDI. Refugees: 83% < 35 yrs. Among them 18% are 0-14 yrs and 82% 15-34 yrs Family-reunification: 80% < 35 yrs, among them 44% are 0-14 yrs and 56% are 15-34 yrs. Work immigrants: 70%, among them all are 15-34 yrs. Students and au-pairs: 95%, among them all are 15-34 yrs

LTBI	Latent tuberculosis infection. We used positive IGRA as a proxy for LTBI.
Number of LTBI	The prevalence of LTBI in the immigrant cohort was estimated by multiplying the number of arriving immigrants with the published estimates of IGRA positives, based on published literature, including a Norwegian publication. Estimates of IGRA positivity ranged from 18%-29%, depending on estimated TB incidence rate in country of origin and age-group; 0-14 yrs and 15-35yrs.
TB and LTBI treatment	We used the categorical information about time in Norway prior to diagnosis from MSIS to estimate a probability distribution for each case's arrival year in Norway. We then estimated the number of individuals with TB or LTBI treatment who belonged to the 2008-2011 cohort of immigrants by multiplying the number of cases by the probability that they immigrated to Norway in 2008-2011.
Preventable TB	We defined preventable TB as a TB patient notified to MSIS with TB and who: (i) arrived to Norway in 2008-2011, (ii) was notified to MSIS > 1 month (6 months) and < 5 years after arrival, (iii) was younger than 40 years of age at notification (to allow for five years observation time after screening). We excluded TB cases that were on TB treatment on arrival to Norway. We then used this number and adjusted for QFT sensitivity 84% (81% -87%), treatment effectiveness at 65% (50%-80), and treatment completion rates at 90% (80% - 100%) to estimate the final number of preventable TB cases belonging to the 2008-2011 cohort.

Appendix 1c, Model assumptions

That immigrants who received residence permit or applied for asylum actually immigrated to Norway.
That immigrants that later were registered as emigrated, or had a final rejection of application for asylum, actually emigrated.
That all immigrants eligible for screening were screened and that they were screened soon after arrival in line with regulations.
That the age- and country specific prevalence of LTBI from published literature, including Norwegian data, is a fair proxy for the prevalence in the arrival cohort.
That a person did not leave Norway after receiving LTBI treatment.

Appendix d, Indexes

Index	Calculation	The use of the indexes
Duration of time spent in Norway (cumulative probability distribution)	Table Y1	To estimate the number of people remaining in Norway in year X who arrived in year Y
Estimated people remaining in Norway in year X who arrived in year Y	Number of arriving immigrants in year Y * proportion of immigrants who remain in Norway for at least (X-Y) years	To calculate person years under observation for the cohort
Person years under observation for the cohort	Estimated number of years spent in Norway for immigrants who arrived in years 2008-2011	Used as the exposure time for the cohort
Risk of preventable TB per time-period	For each time period after arrival to Norway (<1 month, 1-6 months, 7-12 months, 1-2 years, 3-4 years, 5-9 years, and >10 years) we obtained the	Used to calculate the additional preventable TB (see description below)

	number of preventable TB cases and then calculated the risk of preventable TB per time period (i.e. number of cases divided by number of people).	
Monthly risk of preventable TB within time-period	$1-(1-risk)^{\wedge}(1/numbermonths)$.	Used to calculate the 5 year risk of preventable TB without emigration
Number needed to screen (NNS)	Number of arriving immigrants/number of preventable TB	Primary outcome
Crude number needed to treat (NNT)	Number of LTBI positive immigrants/number of preventable TB (a combined effect of emigration and TB risk)	Primary outcome for immigrants without taking emigration into account.
Corrected number needed to treat (NNT)	1/risk of preventable TB (TB risk corrected for the effect of emigration)	NNT measure that is independent of emigration
Number of TB prevented by LTBI treatment	Number of LTBI treated*risk of preventable TB in the different time periods based on the first five years in Norway. Calculations for time periods were based on LTBI positive individuals who remained at risk 1-6 months, 7-12 months, 13-36 months and 37-60 months after arrival to Norway.	Secondary outcome to estimate the number of TB prevented in Norway from the screening programme
Additional preventable TB	We calculated the percentage increase in prevented TB (potential for additional prevention) when LTBI treatment was initiated within the first (i) 6 months and (ii) 12 months after arrival to Norway (based on the 84% sensitivity/65% treatment effectiveness/90% adherence estimates and incident TB > 1 month after arrival).	Secondary outcome to estimate the effect of delay of LTBI treatment initiation

Appendix 2. Number of notified TB cases from the top ten source countries for immigrant TB in Norway, 2008-2015 (Source: MSIS*)

Countries	2008	2009	2010	2011	2012	2013	2014	2015	Total
Somalia	70	106	72	106	112	102	84	47	699
Eritrea	12	24	16	20	23	41	47	49	232
Philippines	20	14	25	23	30	25	26	25	188
Pakistan	20	18	23	20	15	18	15	8	137
Ethiopia	9	27	17	14	15	16	17	15	130
Afghanistan	7	10	19	16	11	18	11	26	118
Thailand	10	16	15	10	11	8	14	13	97
Vietnam	10	15	12	11	7	15	12	7	89
India	7	9	7	4	11	12	9	6	65
Myanmar	11	6	10	8	7	7	3	2	54

MSIS, Norwegian Surveillance System for Infectious Diseases